NMCP COVID-19 Literature Report #49: Friday, 20 November 2020

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Purpose: These weekly reports, published on Fridays, are curated collections of current research, evidence reviews, special reports, grey literature, and news regarding the COVID-19 pandemic that may be of interest to medical providers and leadership. All reports are available online at https://nmcp.libguides.com/covidreport. Access is private; you will need to use the direct link or bookmark the URL, along with the case-sensitive password "NMCPfinest".

Disclaimer: I am not a medical professional. This document is current as of the date noted above. While I make every effort to find and summarize available data, things are changing rapidly, with new research and potentially conflicting literature published daily. Please feel free to reach out with questions, suggestions for future topics, or any other feedback.

Statistics

Global today: 57,076,577 confirmed cases and 1,364,073 deaths in 191 countries/regions

1 week ago: 52,918,582 confirmed cases and 1,295,976 deaths in 191 countries/regions

2 weeks ago: 48,850,917 confirmed cases and 1,235,985 deaths in 190 countries/regions

*United States** top 5 states by cases (Virginia is ranked 20th)

	TOTAL US	TX	CA	FL	IL	NY
Cases	11,740,229	1,105,009	1,079,879	914,333	621,383	579,382
Tests	173,719,264	9,472,674	21,552,528	11,348,596	9,656,497	17,386,368
Deaths	252,838	20,565	18,562	17,810	11,648	34,215

*see census.gov for current US Population data; NA: not all data available JHU CSSE as of 1000 EDT 20 November 2020

Virginia	Total	Chesapeake	Hampton	Newport News	Norfolk	Portsmouth	Suffolk	Virginia Beach
Cases	213,331	5,799	2,506	3,688	6,144	3,053	2,582	9,716
Hospitalized	13,914	514	110	127	434	346	153	500
Deaths	3,912	80	34	53	88	70	80	112

VA DOH as of 1000 EDT 20 November 2020

Note: There will be no report next week as I will be on leave. The next COVID-19 literature report – #50, if you can believe it – is planned for Friday, 04 December 2020.

Special Reports

BCBSA: Missing vaccinations during COVID-19 puts our children & communities at risk (18 November 2020)

> Press release: "Millions of children have missed routine vaccinations this year, causing a precipitous drop in immunizations that threatens to leave communities throughout the U.S. at risk of losing protection against highly contagious diseases, including measles, whooping cough and polio, according to new data from the Blue Cross Blue Shield Association (BCBSA).
>
> As the COVID-19 pandemic prompted Americans to postpone or avoid receiving routine medical care, children are on track to miss an estimated 9 million vaccination doses in 2020, a decrease of up to 26% in childhood vaccination doses compared to 2019….
>
> The new BCBSA vaccine data, based on medical claims from millions of Blue Cross and Blue Shield (BCBS) members, provides clear evidence that the United States is at risk of widespread outbreaks of preventable disease. If current trends continue, the U.S. would fall dangerously below the vaccination levels for measles and whooping cough that the CDC says are needed to protect community health….
>
> BCBSA is preparing a comprehensive analysis of childhood and adolescent vaccination rates, to be released in 2021 as part of its Blue Cross Blue Shield, The Health of America Report® series. Parents and legal guardians looking for additional information can reach out to their local BCBS company to find out what programs are available in their community. For more information, visit https://www.bcbs.com/the-health-of-america."

GAO: COVID-19: Federal Efforts Accelerate Vaccine and Therapeutic Development, but More Transparency Needed on Emergency Use Authorizations (17 November 2020)

> "The federal government, in concert with private industry, has greatly accelerated efforts to develop vaccines and therapeutics for COVID-19 through Operation Warp Speed. This partnership is spending more than $10 billion on 6 vaccine candidates.
>
> In a separate effort to speed access to medical products, the Food and Drug Administration has so far issued four emergency use authorizations, referred to as EUAs, that temporarily allow use of unapproved therapeutics. Its rationale for doing so has not always been clear. To help ensure public trust, we recommended the FDA better communicate the findings of its safety and effectiveness reviews."

Selected Literature: Peer-Reviewed Journals

Date given is the date published or posted online; often these papers are ahead of print.

20 November 2020

MMWR: COVID-19 Outbreak — New York City, February 29–June 1, 2020

> "New York City (NYC) was an early epicenter of the COVID-19 pandemic in the United States.
>
> Approximately 203,000 cases of laboratory-confirmed COVID-19 were reported in NYC during the first 3 months of the pandemic. The crude fatality rate among confirmed cases was 9.2% overall and 32.1% among hospitalized patients. Incidence, hospitalization rates, and mortality were highest among Black/African American and Hispanic/Latino persons, as well as those who were living in neighborhoods with high poverty, aged ≥75 years, and with underlying medical conditions.
>
> Mitigating COVID-19 transmission among vulnerable groups at high risk for hospitalization and death is an urgent priority."

19 November 2020

JAMA Netw Open: Pregnancy Outcomes Among Women With and Without Severe Acute Respiratory Syndrome Coronavirus 2 Infection

> "Question: In a large county health care system with access to inpatient and outpatient testing, is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection associated with pregnancy outcomes, maternal illness severity, placental pathology, and neonatal infections?
>
> Findings: In this cohort study of 252 SARS-CoV-2–positive and 3122 negative pregnant women tested in outpatient and inpatient settings at a large county medical center, adverse pregnancy outcomes were similar, and neonatal infection occurred in 3% of infants, predominantly among infants born to asymptomatic or mildly symptomatic women. Placental abnormalities were not associated with disease severity, and the rate of hospitalization was similar to rates among nonpregnant women.
>
> Meaning: These findings suggest that SARS-CoV-2 infection in pregnancy is not associated with adverse pregnancy outcomes."

JAMA Netw Open: Delirium in Older Patients With COVID-19 Presenting to the Emergency Department

> "Question: How frequently do older adults (aged ≥65 years) with coronavirus disease 2019 (COVID-19) present to the emergency department (ED) with delirium?
>
> Findings: In this cohort study of 817 older ED patients with COVID-19, 28% had delirium at presentation, and delirium was the sixth most common of all presenting symptoms and signs. Among delirious patients, 16% presented with delirium as a primary symptom and 37% had no typical COVID-19 symptoms or signs, such as cough or fever.
>
> Meaning: These findings suggest that older adults with COVID-19 commonly present to the ED with delirium and that delirium should be considered an important presenting symptom of COVID-19."

JAMA Ophthalmol: Eye Protection for Patients With COVID-19 Undergoing Prolonged Prone-Position Ventilation

> "Question: What ophthalmic abnormalities are present in patients with coronavirus disease 2019 in the intensive care unit requiring prolonged prone-position ventilation?
>
> Findings: In this case series, 2 patients with periorbital edema in the prone position had bilateral findings of optic disc edema and retinal hemorrhages as well as a substantial increase in intraocular pressure.
>
> Meaning: Clinicians should be aware of the possible presence of elevated intraocular pressure from periorbital edema due to direct compression of the eye and orbit, and optic disc edema and retinal hemorrhages, which may be associated with a hypercoagulable state, in patients with coronavirus disease 2019 in prolonged prone position in the intensive care unit."

JAMA Otolyaryngol Head Neck Surg: Evaluation of the Incidence and Potential Mechanisms of Tracheal Complications in Patients With COVID-19

> "Question: Are tracheal complications of invasive mechanical ventilation more frequent in patients with coronavirus disease 2019 (COVID-19)?
>
> Findings: In this cohort study of 98 patients with COVID-19 and severe respiratory failure, the incidence of full-thickness tracheal lesions or tracheoesophageal fistulas after prolonged (≥14 days) invasive mechanical ventilation was significantly higher in patients with COVID-19 (46.7%) than matched controls (2.2%).
>
> Meaning: Among patients with COVID-19, treatment with prolonged invasive mechanical ventilation may be associated with increased risk of full-thickness tracheal lesion and/or tracheoesophageal fistula."

18 November 2020

Clin Exp Dermatol: Skin manifestations of COVID-19 in children: Part 1 (12 November 2020)

Clin Exp Dermatol: Skin manifestations of COVID-19 in children: Part 2 (09 November 2020)

Clin Exp Dermatol: Skin manifestations of COVID-19 in children: Part 3 (18 November 2020)

> Three-part review: "In Part 1, we discuss one of the first and most widespread cutaneous manifestations of COVID-19, chilblain-like lesions. In Part 2 we expand to other manifestations, including erythema multiforme, urticaria and Kawasaki disease-like inflammatory multisystemic syndrome. In Part 3, we discuss the histological findings of COVID-19 manifestations, and the testing and management of infected children for both COVID-19 and any other pre-existing conditions."

JAMA: A Proposed Framework and Timeline of the Spectrum of Disease Due to SARS-CoV-2 Infection: Illness Beyond Acute Infection and Public Health Implications

> "This Viewpoint uses clinical observations of the natural course of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection to propose 3 phases of illness: acute infection (what people commonly refer to with the COVID-19 designation); postacute hyperinflammatory illness (referred to clinically as multisystem inflammatory syndrome); and late inflammatory sequelae, manifest as enduring cardiac, neurological, and psychological symptoms."

Lancet: Safety and immunogenicity of ChAdOx1 nCoV-19 vaccine administered in a prime-boost regimen in young and old adults (COV002): a single-blind, randomised, controlled, phase 2/3 trial

> "This study is the fifth published clinical trial of a vaccine against SARS-CoV-2 tested in an older adult population (aged 18–55 years, 56–69 years, and ≥70 years). The vaccine was safe and well tolerated, with reduced reactogenicity in older adults. Antibody responses against the SARS-CoV-2 spike protein were induced in all age groups and were boosted and maintained at 28 days after booster vaccination, including in the 70 years and older group. Cellular immune responses were also induced in all age and dose groups, peaking at day 14 after vaccination.
>
> The populations at greatest risk of serious COVID-19 include people with coexisting health conditions and older adults. The immune correlates of protection against SARS-CoV-2 have not yet been determined, but neutralising antibodies are thought to be associated with protection, and in a COVID-19 non-human primate challenge model, neutralising antibody responses correlated with protection. These findings have led to the use of neutralisation assays to assess immune responses in recent human COVID-19 vaccine trials. Immunisation with ChAdOx1 nCoV-19 results in development of neutralising antibodies against SARS-CoV-

2 in almost 100% of participants including older adults without severe comorbidities, with higher levels in boosted compared with non-boosted groups. Further assessment of the efficacy of this vaccine is warranted in all age groups and individuals with comorbidities."

Sci Immunol: The known unknowns of T cell immunity to COVID-19

"Tremendous progress has been made in understanding the role of T cell immunity in acute and convalescent COVID-19 infection. Here we shed light on the “known unknowns” of pre-existing and acquired T cell responses in relation to acute and convalescent SARS-CoV-2 infection."

17 November 2020

Lancet Infect Dis: Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine in healthy adults aged 18–59 years: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial

"In this first in-human study of CoronaVac, we used a phase 1/2 study design to screen the safety of two doses and two vaccination schedules in a dose-escalation study in a small cohort before expanding the study to a larger cohort to explore the immunogenicity of the vaccine in healthy adults. The immune response in the phase 2 study was substantially higher than in the phase 1 study, which might be due to the difference in preparation process of vaccine batches used in phase 1 and 2 resulting in a higher proportion of intact spike protein on the purified inactivated SARS-CoV-2 virions in the vaccine used in phase 2 than that used in phase 1.

Data from this study support the approval of emergency use of CoronaVac in China, and three phase 3 clinical trials that are ongoing in Brazil, Indonesia, and Turkey."

16 November 2020

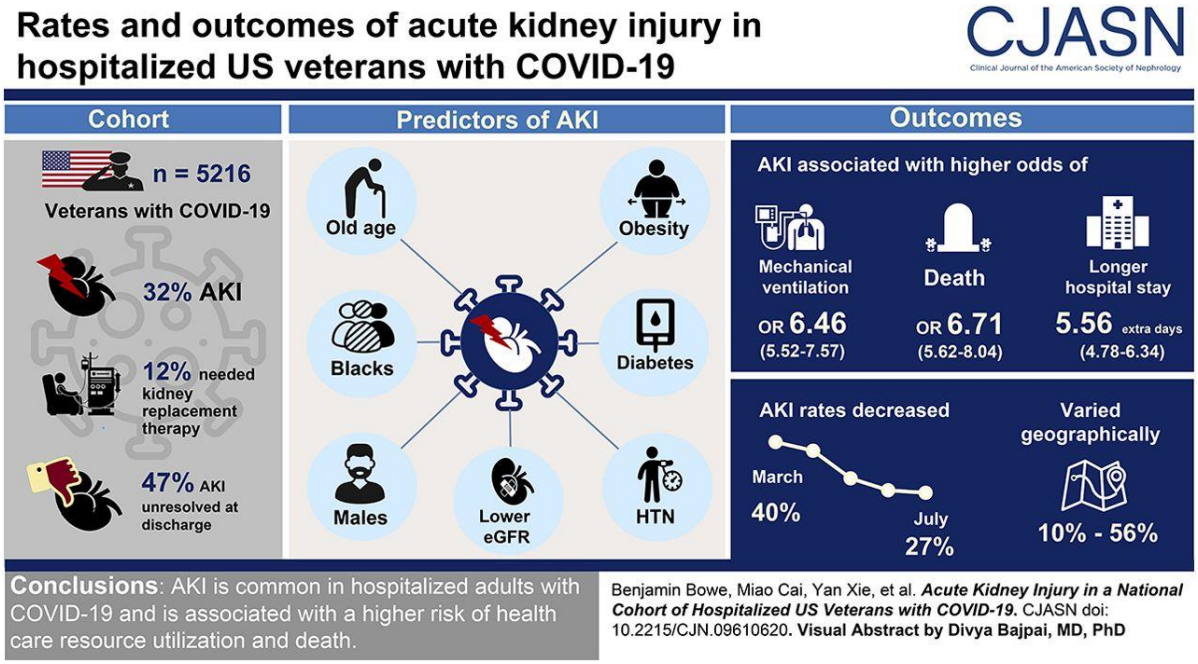
JAMA Intern Med: Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US

"This cohort study examines trends in the use of telemedicine and in-person outpatient visits in 2020 among a national sample of 16.7 million individuals with commercial or Medicare Advantage insurance."

JAMA Intern Med: [Diaphragm Pathology in Critically Ill Patients With COVID-19 and Postmortem Findings From 3 Medical Centers]

> "This case-control study examines the association of COVID-19 with the respiratory muscles in Dutch critically ill patients."

Clin J Am Soc Nephrol: [Acute Kidney Injury in a National Cohort of Hospitalized US Veterans with COVID-19]



Nat Microbiol: [Spike-specific circulating T follicular helper cell and cross-neutralizing antibody responses in COVID-19-convalescent individuals]

> "Coronavirus disease 2019 (COVID-19) is caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)1,2,3 and individuals with COVID-19 have symptoms that can be asymptomatic, mild, moderate or severe4,5. In the early phase of infection, T- and B-cell counts are substantially decreased6,7; however, IgM8,9,10,11 and IgG12,13,14 are detectable within 14 d after symptom onset. In COVID-19-convalescent individuals, spike-specific neutralizing antibodies are variable3,15,16. No specific drug or vaccine is available for COVID-19 at the time of writing; however, patients benefit from treatment with serum from COVID-19-convalescent individuals17,18. Nevertheless, antibody responses and cross-reactivity with other coronaviruses in COVID-19-convalescent individuals are largely unknown. Here, we show that the majority of COVID-19-convalescent individuals maintained SARS-CoV-2 spike S1- and S2-specific antibodies with neutralizing

activity against the SARS-CoV-2 pseudotyped virus, and that some of the antibodies cross-neutralized SARS-CoV, Middle East respiratory syndrome coronavirus or both pseudotyped viruses. Convalescent individuals who experienced severe COVID-19 showed higher neutralizing antibody titres, a faster increase in lymphocyte counts and a higher frequency of CXCR3+ T follicular help (TFH) cells compared with COVID-19-convalescent individuals who experienced non-severe disease. Circulating TFH cells were spike specific and functional, and the frequencies of CXCR3+ TFH cells were positively associated with neutralizing antibody titres in COVID-19-convalescent individuals. No individuals had detectable autoantibodies. These findings provide insights into neutralizing antibody responses in COVID-19-convalescent individuals and facilitate the treatment and vaccine development for SARS-CoV-2 infection."

15 November 2020

Liver Int: Pathophysiological mechanisms of liver injury in COVID-19

"The recent outbreak of coronavirus disease 2019 (COVID-19), caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) has resulted in a world-wide pandemic. Disseminated lung injury with development of acute respiratory distress syndrome (ARDS) is the main cause of mortality in COVID-19. Although liver failure does not seem to occur in the absence of preexisting liver disease, hepatic involvement in COVID-19 may correlate with overall disease severity and serve as prognostic factor for development of ARDS. The spectrum of liver injury in COVID-19 may range from direct infection by SARS-CoV-2, indirect involvement by systemic inflammation, hypoxic changes, iatrogenic causes such as drugs and ventilation to exacerbation of underlying liver disease. This concise review discusses the potential pathophysiological mechanisms for SARS-CoV-2 hepatic tropism as well as acute and possibly long-term liver injury in COVID-19."

14 November 2020

JAMA Cardiol: Outcomes for Out-of-Hospital Cardiac Arrest in the United States During the Coronavirus Disease 2019 Pandemic

"Question: What is the association between the coronavirus disease 2019 (COVID-19) pandemic and out-of-hospital cardiac arrest (OHCA) outcomes in the US?

Findings: This registry study found that rates of return of spontaneous circulation were 18% lower overall than before the pandemic, including 11% to 15% lower in communities with low COVID-19 mortality. Rates of survival to discharge were 17% lower, primarily in

communities with moderate to high COVID-19 mortality, and incidence of OHCA was higher, but largely in communities with high COVID-19 mortality.

Meaning: The outcomes of OHCA were worse during the first weeks of the COVID-19 pandemic in the US, and this was observed not only in areas with high case-fatality rates but also ones with lower rates."

Open Forum Infect Dis: Three-month pulmonary function and radiological outcomes in COVID-19 survivors: a longitudinal patient cohort study

"This study aimed to investigate pulmonary function and radiological outcomes in a group of coronavirus disease 2019 (COVID-19) survivors.

172 COVID-19 survivors in a follow-up clinic in a referral hospital underwent high resolution computed tomography (CT) of the thorax and pulmonary function tests at three month after hospital discharge.

The median duration from hospital discharge to radiological and pulmonary function test was 90 (interquartile range=88-95) days. The abnormal pulmonary function was found in 11 (6.40%) patients, and abnormal small airway function (FEF25-75%) in 12 (6.98%). Six (3.49%) patients had obstructive ventilation impairment and six (3.49%) had restrictive ventilatory impairment. No significant differences in lung function parameters were observed between the non-severe and severe groups. Of 142 COVID-19 patients performed CT scan, 122 (85.91%) showed residual CT abnormalities and 52 (36.62%) showed chronic and fibrotic changes. The ground-glass opacities absorption in the lungs of severe cases was less satisfactory than that of non-severe patients. The severe paients had higher CT scores than non-severe cases (2.00 versus 0.00, $P < 0.001$)

Of the COVID-19 survivors, 6.40% still present pulmonary function abnormality three month after discharge, which did not vary by disease severity during hospitalization. 85.91% patients had abnormalities on chest CT, with fibrous stripes and ground glass opacity as the most common pattern."

13 November 2020

J Antimicrob Chemother: An observational cohort study of bacterial co-infection and implications for empirical antibiotic therapy in patients presenting with COVID-19 to hospitals in North West London

"In this retrospective observational cohort study, we included all adult non-pregnant patients who were admitted to two acute hospitals in North West London in March and April 2020 and confirmed to have COVID-19 infection within 2 days of admission. Results of microbiological specimens taken within 48 hours of admission were reviewed and their

clinical significance was assessed. Empirical antibiotic treatment of representative patients was reviewed. Patient age, gender, co-morbidities, inflammatory markers at admission, admission to ICU and 30 day all-cause in-hospital mortality were collected and compared between patients with and without bacterial co-infections.

Of the 1396 COVID-19 patients included, 37 patients (2.7%) had clinically important bacterial co-infection within 48 hours of admission. The majority of patients (36/37 in those with co-infection and 98/100 in selected patients without co-infection) received empirical antibiotic treatment. There was no significant difference in age, gender, pre-existing illnesses, ICU admission or 30 day all-cause mortality in those with and without bacterial co-infection. However, white cell count, neutrophil count and CRP on admission were significantly higher in patients with bacterial co-infections.

We found that bacterial co-infection was infrequent in hospitalized COVID-19 patients within 48 hours of admission. These results suggest that empirical antimicrobial treatment may not be necessary in all patients presenting with COVID-19 infection, although the decision could be guided by high inflammatory markers."

MMWR: Mental Health–Related Emergency Department Visits Among Children Aged <18 Years During the COVID-19 Pandemic — United States, January 1–October 17, 2020

"Emergency departments (EDs) are often the first point of care for children's mental health emergencies. U.S. ED visits for persons of all ages declined during the early COVID-19 pandemic (March–April 2020).

Beginning in April 2020, the proportion of children's mental health–related ED visits among all pediatric ED visits increased and remained elevated through October. Compared with 2019, the proportion of mental health–related visits for children aged 5–11 and 12–17 years increased approximately 24%. and 31%, respectively.

Monitoring indicators of children's mental health, promoting coping and resilience, and expanding access to services to support children's mental health are critical during the COVID-19 pandemic."

MMWR: Risk Assessment and Management of COVID-19 Among Travelers Arriving at Designated U.S. Airports, January 17–September 13, 2020

"As an early effort to prevent importation of SARS-CoV-2, CDC established entry screening at designated airports for passengers from certain countries.

Passenger entry screening was resource-intensive with low yield of laboratory-diagnosed COVID-19 cases (one case per 85,000 travelers screened). Contact information was missing for a substantial proportion of screened travelers in the absence of manual data collection.

Symptom-based screening programs are ineffective because of the nonspecific clinical presentation of COVID-19 and asymptomatic cases. Reducing COVID-19 importation has transitioned to enhancing communication with travelers to promote recommended preventive measures, strengthening response capacity at ports of entry, and encouraging predeparture and postarrival testing. Collection of contact information from international air passengers before arrival would facilitate timely postarrival management when indicated."

Nat Commun: Associations between blood type and COVID-19 infection, intubation, and death

"The rapid global spread of the novel coronavirus SARS-CoV-2 has strained healthcare and testing resources, making the identification and prioritization of individuals most at-risk a critical challenge. Recent evidence suggests blood type may affect risk of severe COVID-19. Here, we use observational healthcare data on 14,112 individuals tested for SARS-CoV-2 with known blood type in the New York Presbyterian (NYP) hospital system to assess the association between ABO and Rh blood types and infection, intubation, and death. We find slightly increased infection prevalence among non-O types. Risk of intubation was decreased among A and increased among AB and B types, compared with type O, while risk of death was increased for type AB and decreased for types A and B. We estimate Rh-negative blood type to have a protective effect for all three outcomes. Our results add to the growing body of evidence suggesting blood type may play a role in COVID-19."

Sci Adv: Distinct inflammatory profiles distinguish COVID-19 from influenza with limited contributions from cytokine storm

"We pursued a study of immune responses in COVID-19 and influenza cohorts. Compared to influenza patients, COVID-19 patients exhibited largely equivalent lymphocyte counts, fewer monocytes, and lower surface HLA-class II expression on select monocyte populations. Furthermore, decreased HLA-DR on intermediate monocytes was a significant predictor of COVID-19 disease severity. In contrast to prevailing assumptions about COVID-19 disease immunopathology, very few (7 of 168) COVID-19 patients exhibited cytokine profiles indicative of Cytokine Storm Syndrome. After controlling for key confounding factors such as age and sample time point, COVID-19 patients exhibited lower cytokine levels than influenza patients. Up-regulation of IL-6, GCSF, IL-1RA, and MCP1 predicted death from acute respiratory failure among COVID-19 patients but were not statistically higher than influenza patients. Single-cell transcriptional profiling was concordant with profound suppression in interferon signaling among COVID-19 patients. When considered across the spectrum of peripheral immune profiles, COVID-19 patients are less inflamed than influenza patients."

12 November 2020

PLoS Pathog: Virulence and pathogenesis of SARS-CoV-2 infection in rhesus macaques: A nonhuman primate model of COVID-19 progression

> "Author Summary: Understanding of the pathologic process caused by SARS-CoV-2 is critical for promoting vaccine evaluations and medical treatment. Prior to the development of this model, several animal models of SARS-CoV-2 infection focused on revealing the virus shedding period, the development of interstitial pneumonia, and virus dissemination in respiratory tract. However, data describing the kinetics of the T cell response and local immune response during SARS-CoV-2 infection are lacking. Here, in our rhesus macaque model, in addition to focusing on virus shedding and interstitial pneumonia similar with human cases, we observed the response of T cell subsets and local cytokine/chemokine changes in respiratory tract regarded as the important evaluation parameters for a successful animal model of COVID-19."

Science: SARS-CoV-2 D614G variant exhibits efficient replication ex vivo and transmission in vivo

> "The spike D614G substitution is prevalent in global SARS-CoV-2 strains, but its effects on viral pathogenesis and transmissibility remain unclear. We engineered a SARS-CoV-2 variant containing this substitution. The variant exhibits more efficient infection, replication, and competitive fitness in primary human airway epithelial cells, but maintains similar morphology and in vitro neutralization properties, compared with the ancestral wild-type virus. Infection of human angiotensin-converting enzyme 2 (ACE2) transgenic mice and Syrian hamsters with both viruses resulted in similar viral titers in respiratory tissues and pulmonary disease. However, the D614G variant transmits significantly faster and displayed increased competitive fitness than the wild-type virus in hamsters. These data show that the D614G substitution enhances SARS-CoV-2 infectivity, competitive fitness, and transmission in primary human cells and animal models."
>
> See also: Spike mutation D614G alters SARS-CoV-2 fitness (Nature; 26 October 2020)

11 November 2020

Ann Intern Med: Insights From Rapid Deployment of a "Virtual Hospital" as Standard Care During the COVID-19 Pandemic

> "Background: Pandemics disrupt traditional health care operations by overwhelming system resource capacity but also create opportunities for care innovation.
>
> Objective: To describe the development and rapid deployment of a virtual hospital program, Atrium Health hospital at home (AH-HaH), within a large health care system.

Design: Prospective case series.

Setting: Atrium Health, a large integrated health care organization in the southeastern United States.

Patients: 1477 patients diagnosed with coronavirus disease 2019 (COVID-19) from 23 March to 7 May 2020 who received care via AH-HaH.

Intervention: A virtual hospital model providing proactive home monitoring and hospital-level care through a virtual observation unit (VOU) and a virtual acute care unit (VACU) in the home setting for eligible patients with COVID-19.

Measurements: Patient demographic characteristics, comorbid conditions, treatments administered (intravenous fluids, antibiotics, supplemental oxygen, and respiratory medications), transfer to inpatient care, and hospital outcomes (length of stay, intensive care unit [ICU] admission, mechanical ventilation, and death) were collected from electronic health record data.

Results: 1477 patients received care in either the AH-HaH VOU or VACU or both settings, with a median length of stay of 11 days. Of these, 1293 (88%) patients received care in the VOU only, with 40 (3%) requiring inpatient hospitalization. Of these 40 patients, 16 (40%) spent time in the ICU, 7 (18%) required ventilator support, and 2 (5%) died during their hospital admission. In total, 184 (12%) patients were ever admitted to the VACU, during which 21 patients (11%) required intravenous fluids, 16 (9%) received antibiotics, 40 (22%) required respiratory inhaler or nebulizer treatments, 41 (22%) used supplemental oxygen, and 24 (13%) were admitted as an inpatient to a conventional hospital. Of these 24 patients, 10 (42%) required ICU admission, 1 (3%) required a ventilator, and none died during their hospital admission.

Limitation: Generalizability is limited to patients with a working telephone and the ability to comply with the monitoring protocols.

Conclusion: Virtual hospital programs have the potential to provide health systems with additional inpatient capacity during the COVID-19 pandemic and beyond."

Bioessays: Why does COVID-19 pathology have several clinical forms?

"The outbreak of a new, potentially fatal virus, SARS-COV-2, which started in December 2019 in Wuhan, China, and since developed into a pandemic has stimulated research for an effective treatment and vaccine. For this research to be successful, it is necessary to understand the pathology of the virus. So far, we know that this virus can harm different organs of the body. Although the exact mechanisms are still unknown, this phenomenon may result from the body's secretion of prostaglandin E2 (PGE2), which is involved in several inflammation and immunity pathways. Noticeably, the expression of this molecule

can lead to a cytokine storm causing a variety of side effects. In this paper, we discuss those side effects in SARS-COV-2 infection separately to determine whether PGE2 is, indeed, an important causative factor. Lastly, we propose a mechanism by which PGE2 production increases in response to COVID-19 disease and suggest the possible direct relation between PGE2 levels and the severity of this disease."

See also video abstract: https://youtu.be/SnPFAcjxxKw

Clin Cardiol: COVID-19, thromboembolic risk, and Virchow's triad: Lesson from the past

"COronavirus Infectious Disease which started in 2019 (COVID-19) usually presents with the signs and symptoms of pneumonia. However, a growing number of recent reports highlight the fact that the infection may be by far more than only a respiratory disease. There is evidence of an increased thromboembolic risk in COVID-19 patients, with a variety of manifestations in terms of ischemic stroke, deep vein thrombosis, acute pulmonary embolism, acute myocardial infarction, systemic arterial embolism, and placental thrombosis. The German physician Rudolph Virchow, about two centuries ago, described three pivotal factors contributing together to thromboembolic risk: endothelial injury, hypercoagulability, and blood stasis. COVID-19-associated hypercoagulability is unique and distinctive, and has its own features involving the immune system. Many of the drugs proposed and currently undergoing evaluation for the treatment of COVID-19 have one or more of the Virchow's triad elements as a target. The three factors outlined by Virchow are still able to explain the venous and arterial hypercoagulable state in the dramatic COVID-19 setting. Nowadays, we have decidedly more sophisticated diagnostic tools than Virchow had, but many of the challenges that we are facing are the same as Virchow faced in the 19th century."

10 November 2020

Drug Alcohol Rev: Purchasing, consumption, demographic and socioeconomic variables associated with shifts in alcohol consumption during the COVID-19 pandemic

"A cross-sectional convenience sample of 2307 Australians aged 18 and over who drank at least monthly was recruited through social media. Respondents were asked about their alcohol consumption and purchasing in 2019 prior to the epidemic plus similar questions about their experiences in the month prior to being surveyed between 29 April and 16 May 2020.

Reports of average consumption before (3.53 drinks per day [3.36, 3.71 95% confidence interval]) and during (3.52 [3.34, 3.69]) the pandemic were stable. However, young men and those who drank more outside the home in 2019 reported decreased consumption during the pandemic, and people with high levels of stress and those who bulk-bought alcohol

when restrictions were announced reported an increase in consumption relative to those who did not.

A reported increase in consumption among those experiencing more stress suggests that some people may have been drinking to cope during the epidemic. Conversely, the reported decrease in consumption among those who drank more outside of their home in 2019 suggests that closing all on-trade sales did not result in complete substitution of on-premise drinking with home drinking in this group. Monitoring of relevant subgroups to assess long-term changes in consumption in the aftermath of the epidemic is recommended."

Otolaryngol Head Neck Surg: Potential Influence of Olfactory, Gustatory, and Pharyngolaryngeal Sensory Dysfunctions on Swallowing Physiology in COVID-19

"Persistent smell and taste disorders have been reported as some of the most common symptoms after COVID-19 (coronavirus disease 2019). Sensory, olfactory, and gustatory functions perform an important role in the initiation and modulation of oropharyngeal swallow biomechanics and salivation as well as in mealtime enjoyment and appetite. Yet, the details of this interaction remain relatively unknown in patients who are infected with and recovering from COVID-19. In this commentary, we discuss the possible impacts of SARS-CoV-2 on the central and peripheral nervous system and consider the pathophysiology of olfactory, gustatory, and pharyngolaryngeal sensory deficits and its influence on deglutition, describing hypotheses and offering guidance for future research."

Vaccine: Caregiver willingness to vaccinate their children against COVID-19: Cross sectional survey

"An international cross sectional survey of 1541 caregivers arriving with their children to 16 pediatric Emergency Departments (ED) across six countries from March 26 to May 31, 2020.

65% (n = 1005) of caregivers reported that they intend to vaccinate their child against COVID-19, once a vaccine is available. A univariate and subsequent multivariate analysis found that increased intended uptake was associated with children that were older, children with no chronic illness, when fathers completed the survey, children up-to-date on their vaccination schedule, recent history of vaccination against influenza, and caregivers concerned their child had COVID-19 at the time of survey completion in the ED. The most common reason reported by caregivers intending to vaccinate was to protect their child (62%), and the most common reason reported by caregivers refusing vaccination was the vaccine's novelty (52%).

The majority of caregivers intend to vaccinate their children against COVID-19, though uptake will likely be associated with specific factors such as child and caregiver demographics and vaccination history. Public health strategies need to address barriers to uptake by providing evidence about an upcoming COVID-19 vaccine's safety and efficacy,

highlighting the risks and consequences of infection in children, and educating caregivers on the role of vaccination."

09 November 2020

Acta Anaesthesiol Scand: Prone positioning in mechanically ventilated patients with severe acute respiratory distress syndrome and coronavirus disease 2019

"This case series from a single, tertiary university hospital includes all mechanically ventilated patients with COVID-19 and proning between March 17, 2020 and May 19, 2020. The primary measure was change in PaO2:FiO2.

44 patients, 32 males/12 females, were treated with proning for a total of 138 sessions, with median (range) 2 (1-8) sessions. Median (IQR) time for the five sessions was 14 (12-17) hours. In the first session, median (IQR) PaO2:FiO2 increased from 104 (86-122) to 161 (127-207) mm Hg (p<0.001). 36 out of 44 patients (82%) improved in PaO2:FiO2, with a significant increase in PaO2:FiO2 in the first three sessions. Median (IQR) FiO2 decreased from 0.7 (0.6-0.8) to 0.5 (0.35-0.6) (<0.001). A significant decrease occurred in the first three sessions. PaO2, tidal volumes, PEEP, mean arterial pressure and norepinephrine infusion did not differ. Primarily, patients with PaO2:FiO2 approximately <120 mm Hg before treatment responded to proning. Age, sex, BMI, or SAPS 3 did not predict success in increasing PaO2:FiO2.

Proning increased PaO2:FiO2, primarily in patients with PaO2:FiO2 approximately < 120 mmHg, with a consistency over three sessions. No characteristic was associated with non-responding, why proning may be considered in most patients. Further study is required to evaluate mortality."

Circulation: Acute Cardiovascular Manifestations in 286 Children with Multisystem Inflammatory Syndrome Associated with COVID-19 Infection in Europe

"A real-time internet-based survey endorsed by the Association for European Paediatric and Congenital Cardiologists (AEPC) Working Groups for Cardiac Imaging and Cardiovascular Intensive Care. Inclusion criteria was children 0-18 years admitted to hospital between February 1 and June 6, 2020 with diagnosis of an inflammatory syndrome and acute cardiovascular complications.

Results: A total of 286 children from 55 centers in 17 European countries were included. The median age was 8.4 years (IQR 3.8-12.4 years) and 67% were males. The most common cardiovascular complications were shock, cardiac arrhythmias, pericardial effusion and coronary artery dilatation. Reduced left ventricular ejection fraction was present in over half of the patients and a vast majority of children had raised cardiac troponin (cTnT) when

checked. The biochemical markers of inflammation were raised in majority of patients on admission: elevated CRP, serum ferritin, procalcitonin, NT-proBNP, IL-6 level and D-dimers. There was a statistically significant correlation between degree of elevation in cardiac and biochemical parameters and need for intensive care support ($p < 0.05$). Polymerase chain reaction (PCR) for SARS-CoV-2 was positive in 33.6% while IgM and IgG antibodies were positive in 15.7% and IgG 43.6 % cases, respectively when checked. One child died in the study cohort.

Conclusions: Cardiac involvement is common in children with multisystem inflammatory syndrome associated with Covid-19 pandemic. A majority of children have significantly raised levels of NT pro-BNP, ferritin, D-dimers and cardiac troponin in addition to high CRP and procalcitonin levels. Compared to adults with Covid-19, mortality in children with MIS-C is uncommon despite multi-system involvement, very elevated inflammatory markers and need for intensive care support."

J Occup Environ Hyg: The impact of extreme reuse and extended wear conditions on protection provided by a surgical-style N95 filtering facepiece respirator

"Most respirators employed in health care settings, and often in first responder and industrial settings, are intended for single-use: the user dons the respirator, performs a work activity, and then doffs and discards the respirator. However, in the current COVID-19 pandemic, in the presence of persistent shortages of personal protective equipment, extended use and reuse of filtering facepiece respirators are routinely contemplated by many health care organizations. Further, there is considerable current effort to understand the effect of sterilization on the possibility of reuse, and some investigations of performance have been conducted. While the ability of such a respirator to continue to provide effective protection after repeated sanitization cycles is a critical component of implementing its reuse, of equal importance is an understanding of the impact that reusing the respirator multiple times in a day while performing work tasks, and even extending its wear over multiple days, has on the workplace protective performance. In this study, we subjected a stockpiled quantitatively fitted surgical style N95 filtering facepiece respirator device to extreme reuse and extended wear conditions (up to 19 uses over a duration of 5 days) and measured its protective performance at regular intervals, including simulated workplace protection factor measurements using total inward leakage. With this respirator, it was shown to be possible to maintain protection corresponding to an assigned protection factor greater than 10 under extreme usage conditions provided an individual is properly trained in the use of, and expertly fitted in, the respirator. Other factors such as hygiene and strap breakage are likely to place limits on reuse."

PLoS One: [Persistent fatigue following SARS-CoV-2 infection is common and independent of severity of initial infection]

> "Fatigue is a common symptom in those presenting with symptomatic COVID-19 infection. However, it is unknown if COVID-19 results in persistent fatigue in those recovered from acute infection. We examined the prevalence of fatigue in individuals recovered from the acute phase of COVID-19 illness using the Chalder Fatigue Score (CFQ-11). We further examined potential predictors of fatigue following COVID-19 infection, evaluating indicators of COVID-19 severity, markers of peripheral immune activation and circulating pro-inflammatory cytokines.
>
> Of 128 participants (49.5 ± 15 years; 54% female), more than half reported persistent fatigue (67/128; 52.3%) at median of 10 weeks after initial COVID-19 symptoms. There was no association between COVID-19 severity (need for inpatient admission, supplemental oxygen or critical care) and fatigue following COVID-19. Additionally, there was no association between routine laboratory markers of inflammation and cell turnover (leukocyte, neutrophil or lymphocyte counts, neutrophil-to-lymphocyte ratio, lactate dehydrogenase, C-reactive protein) or pro-inflammatory molecules (IL-6 or sCD25) and fatigue post COVID-19. Female gender and those with a pre-existing diagnosis of depression/anxiety were over-represented in those with fatigue.
>
> Our findings demonstrate a significant burden of post-viral fatigue in individuals with previous SARS-CoV-2 infection after the acute phase of COVID-19 illness. This study highlights the importance of assessing those recovering from COVID-19 for symptoms of severe fatigue, irrespective of severity of initial illness, and may identify a group worthy of further study and early intervention."

07 November 2020

J Infect Dis: [Possible auto-antigens that may explain the post-infection autoimmune manifestations in COVID-19 patients displaying neurological conditions]

> "Here, we report 4 human proteins involved in autoimmunity that potentially act as autoantigens in COVID-19 patients with neurological damage….
>
> Our results include 4 human proteins homologous to SARS-COV-2 that could possibly be acting as autoantigens in COVID-19 patients displaying neurological conditions. One of them is Heat Shock Protein 90 alpha family class B member 1 (HSP90AB1, known to be involved in GBS), as previously reported. The other three are heat shock protein family A (Hsp70) member 5 (HSPA5/GRP78, involved in neuromyelitis optica), titin (TTN, involved in myasthenia gravis) and ryanodine receptor 2 (RYR2, involved in myasthenia gravis). Epitope

sequences on SARS-CoV-2 and homologous human self-antigen sequences are as given in the table."

J Thromb Thrombolysis: Delayed catastrophic thrombotic events in young and asymptomatic post COVID-19 patients

" During the months of April 2020 to July 2020, Singapore experienced a surge in COVID-19 cases amongst our migrant workers. Subsequently, in July 2020 to September 2020, 4 young healthy migrant workers presented with catastrophic, large arterial thromboses…. Their median age was 38.5 years, and they were of South Asian ethnicity….

Although small, our case series suggests that catastrophic vascular events can occur unexpectedly in fit patients with mild or asymptomatic COVID-19 infection and may unpredictably happen many weeks later."

J Thromb Thrombolysis: Lupus anticoagulant and mortality in patients hospitalized for COVID-19

"Coronavirus disease 2019 (COVID-19) is characterized by a procoagulant state that can lead to fatal thromboembolic events. Several studies have documented a high prevalence of lupus anticoagulant that may at least partially explain the procoagulant profile of COVID-19. However, the association between lupus anticoagulant and thrombotic complications in COVID-19 is controversial and no study has specifically evaluated the impact of lupus anticoagulant on mortality.

The aim of our study was to investigate the association between lupus anticoagulant and mortality in a large group of 192 consecutive patients hospitalized for COVID-19. Lupus anticoagulant was found in 95 patients (49.5%). No difference in the percentage of patients with lupus anticoagulant was observed between 130 survivors and 62 non-survivors (47.7 versus 53,2%; p = 0.4745). When the combined outcome of death or need for mechanical ventilation in survivors was taken into account, the difference in the prevalence of patients with lupus anticoagulant between the patients with the combined outcome (n = 76) and survivors who did not require mechanical ventilation (n = 116) was not significant (52.6% versus 47.4%; p = 0.4806). In multivariate analysis predictors of mortality or need for mechanical ventilation in survivors were obesity, low oxygen saturation and elevated troponin levels measured on admission.

In conclusion, our study did not show any association of lupus anticoagulant with mortality and with need for mechanical ventilation in survivors. The role of obesity, low SaO2 and elevated troponin levels as predictors of a worse prognosis in patients hospitalized for COVID-19 was confirmed."

ICYMI (older than last 2 weeks)

Hum Reprod: SARS-CoV-2 in first trimester pregnancy: a cohort study (published 04 November 2020)

Study question: Does maternal infection with SARS-CoV-2 in first trimester pregnancy have an impact on the fetal development as measured by nuchal translucency thickness and pregnancy loss?

Summary answer: Nuchal translucency thickness at the first trimester scan was not significantly different in pregnant women with versus without SARS-CoV-2 infection in early pregnancy and there was no significant increased risk of pregnancy loss in women with SARS-CoV-2 infection in the first trimester.

What is known already: Pregnant women are more vulnerable to viral infections. Previous coronavirus epidemics have been associated with increased maternal morbidity, mortality and adverse obstetric outcomes. Currently, no evidence exists regarding possible effects of SARS-CoV-2 in first trimester pregnancies.

Study design, size, duration: Cohort study of 1,019 women with a double test taken between Feb. 17 and Apr. 23, 2020, as a part of the combined first trimester risk assessment, and 36 women with a first trimester pregnancy loss between Apr. 14 and May 21, 2020, prior to the double test. The study period was during the first SARS-CoV-2 epidemic wave in Denmark.

Participants/materials, setting, methods: Cohort 1 included pregnant women with a double test taken within the study period. The excess serum from each double test was analyzed for SARS-CoV-2 antibodies. Results were correlated to the nuchal translucency thickness and the number of pregnancy losses before or at the time of the first trimester scan. Cohort 2 included women with a pregnancy loss before the gestational age for double test sample. Serum from a blood test taken the day the pregnancy loss was identified was analyzed for SARS-CoV-2 antibodies. The study was conducted at a public university hospital serving approximately 12% of pregnant women and births in Denmark. All participants in the study provided written informed consent.

Main results and the role of chance: Eighteen (1.8%) women had SARS-CoV-2 antibodies in the serum from the double test suggestive of SARS-CoV-2 infection in early pregnancy. There was no significant difference in nuchal translucency thickness for women testing positive for previous SARS-CoV-2 infection (n = 18) versus negative (n = 994) (p = 0.62). There was no significant increased risk of pregnancy loss for women with positive antibodies (n = 1) (OR 3.4, 0.08-24.3 95% CI, p = 0.27). None of the women had been hospitalized due to SARS-CoV-2 infection. None of the women with pregnancy loss prior to the double test (Cohort 2) had SARS-CoV-2 antibodies.

Limitations, reasons for caution: These results may only apply to similar populations and to patients who do not require hospitalization due to SARS-CoV-2 infection. A limitation of the study is that only 1.8% of the study population had SARS-CoV-2 antibodies suggestive of previous infection.

Wider implication of the findings: Maternal SARS-CoV-2 infection had no effect on the nuchal translucency thickness and there was no significant increased risk of pregnancy loss for women with SARS-CoV-2 infection in first trimester pregnancy. Evidence concerning Covid-19 in pregnancy is still limited. These data indicate that infection with SARS-CoV-2 in not hospitalized women does not pose a significant threat in first trimester pregnancies. Follow up studies are needed to establish any risk to a fetus exposed to maternal SARS-CoV-2 infection."

Neth Heart J: Dutch cardiology residents and the COVID-19 pandemic: Every little thing counts in a crisis (published 03 November 2020)

"The COVID-19 pandemic has overwhelmed healthcare systems worldwide, and a large part of regular cardiology care came to a quick halt. A Dutch nationwide survey showed that 41% of cardiology residents suspended their training and worked at COVID-19 cohort units for up to 3 months. With tremendous flexibility, on-call schedules were altered and additional training was provided in order for residents to be directly available where needed most. These unprecedented times have taught them important lessons on crisis management. The momentum is used to incorporate novel tools for patient care. Moreover, their experience of pandemic and crisis management has provided future cardiologists with unique skills. This crisis will not be wasted; however, several challenges have to be overcome in the near future including, but not limited to, a second pandemic wave, a difficult labour market due to an economic recession, and limitations in educational opportunities."

Med Lav: Assessment of air and surfaces contamination in a COVID-19 non-Intensive Care Unit (published 31 October 2020)

"This is the first Italian study aiming to assess the magnitude of environmental contamination in a COVID-19 non-Intensive Care Unit.

In addition to ordinary cleaning procedures, surface and air samplings have been performed before and after the application of two different sanitization devices. Samples have been analyzed with Real Time-Polymerase Chain Reaction in order to find viral RNA.

All samples obtained from surfaces and air before and after extra-ordinary sanitization procedures turned out negative for viral detection.

These findings highlight the efficiency of ordinary cleaning procedures in guaranteeing a safer workplace. The adoption of additional sanitization protocols should be considered in order to further reduce environmental viral contamination."

Clin Infect Dis: Repeat COVID-19 Molecular Testing: Correlation of SARS-CoV-2 Culture with Molecular Assays and Cycle Thresholds (published 27 October 2020)

> "A two months cohort of retrospective data and consecutively collected specimens from COVID-19 patients or patients under investigation were used to understand the correlation between prolonged viral RNA positive test results, cycle threshold (Ct) values and growth of SARS-CoV-2 in cell culture. Whole genome sequencing was used to confirm virus genotype in patients with prolonged viral RNA detection. Droplet digital PCR (ddPCR) was used to assess the rate of false negative COVID-19 diagnostic tests.
>
> In two months, 29,686 specimens were tested and 2,194 patients received repeated testing. Virus recovery in cell culture was noted in specimens with SARS-CoV-2 target genes' Ct value average of 18.8 ± 3.4. Prolonged viral RNA shedding was associated with positive virus growth in culture in specimens collected up to 20 days after the first positive result but mostly in individuals symptomatic at time of sample collection. Whole genome sequencing provided evidence the same virus was carried over time. Positive tests following negative tests had Ct values higher than 29.5 and were not associated with virus culture. ddPCR was positive in 5.6% of negative specimens collected from COVID-19 confirmed or clinically suspected patients.
>
> Low Ct values in SARS-CoV-2 diagnostic tests were associated with virus growth in cell culture. Symptomatic patients with prolonged viral RNA shedding can also be infectious."

Selected Literature: Preprints

Preprints are found on preprint servers such as arXiv, bioRxiv, and medRxiv; they are commonly used for biomedical research. Preprints may later be published in peer-reviewed journals.

Per medRxiv: "Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

medRxiv: Antibodies to SARS-CoV-2 are associated with protection against reinfection (posted 19 November 2020)

> "Background It is critical to understand whether infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) protects from subsequent reinfection.
>
> Methods We investigated the incidence of SARS-CoV-2 PCR-positive results in seropositive and seronegative healthcare workers (HCWs) attending asymptomatic and symptomatic staff testing at Oxford University Hospitals, UK. Baseline antibody status was determined

using anti-spike and/or anti-nucleocapsid IgG assays and staff followed for up to 30 weeks. We used Poisson regression to estimate the relative incidence of PCR-positive results and new symptomatic infection by antibody status, accounting for age, gender and changes in incidence over time.

Results A total of 12219 HCWs participated and had anti-spike IgG measured, 11052 were followed up after negative and 1246 after positive antibody results including 79 who seroconverted during follow up. 89 PCR-confirmed symptomatic infections occurred in seronegative individuals (0.46 cases per 10,000 days at risk) and no symptomatic infections in those with anti-spike antibodies. Additionally, 76 (0.40/10,000 days at risk) anti-spike IgG seronegative individuals had PCR-positive tests in asymptomatic screening, compared to 3 (0.21/10,000 days at risk) seropositive individuals. Overall, positive baseline anti-spike antibodies were associated with lower rates of PCR-positivity (with or without symptoms) (adjusted rate ratio 0.24 [95%CI 0.08-0.76, p=0.015]). Rate ratios were similar using anti-nucleocapsid IgG alone or combined with anti-spike IgG to determine baseline status.

Conclusions Prior SARS-CoV-2 infection that generated antibody responses offered protection from reinfection for most people in the six months following infection. Further work is required to determine the long-term duration and correlates of post-infection immunity"

bioRxiv: Immunological memory to SARS-CoV-2 assessed for greater than six months after infection (16 November 2020)

"Understanding immune memory to SARS-CoV-2 is critical for improving diagnostics and vaccines, and for assessing the likely future course of the pandemic. We analyzed multiple compartments of circulating immune memory to SARS-CoV-2 in 185 COVID-19 cases, including 41 cases at ≥6 months post-infection. Spike IgG was relatively stable over 6+ months. Spike-specific memory B cells were more abundant at 6 months than at 1 month. SARS-CoV-2-specific CD4+ T cells and CD8+ T cells declined with a half-life of 3-5 months. By studying antibody, memory B cell, CD4+ T cell, and CD8+ T cell memory to SARS-CoV-2 in an integrated manner, we observed that each component of SARS-CoV-2 immune memory exhibited distinct kinetics."

medRxiv: Role of air temperature and humidity in the transmission of SARS-CoV-2 in the United States (posted 16 November 2020)

"Improved understanding of the effects of meteorological conditions on the transmission of SARS-CoV-2, the causative agent for COVID-19 disease, is urgently needed to inform mitigation efforts. Here, we estimated the relationship between air temperature or specific humidity (SH) and SARS-CoV-2 transmission in 913 U.S. counties with abundant reported infections from March 15 to August 31, 2020. Specifically, we quantified the associations of daily mean temperature and SH with daily estimates of the SARS-CoV-2 reproduction

number (Rt) and calculated the fraction of Rt attributable to these meteorological conditions. Both lower temperature and lower SH were significantly associated with increased Rt. The fraction of Rt attributable to temperature was 5.10% (95% eCI: 5.00 - 5.18%), and the fraction of Rt attributable to SH was 14.47% (95% eCI: 14.37 - 14.54%). These fractions generally were higher in northern counties than in southern counties. Our findings indicate that cold and dry weather are moderately associated with increased SARS-CoV-2 transmissibility, with humidity playing a larger role than temperature."

medRxiv: Dysregulated immunity in SARS-CoV-2 infected pregnant women (posted 16 November 2020)

"Importance: The effects of SARS-CoV-2 infection on immune responses during pregnancy have not been systematically evaluated. Objective: To assess the impact of SARS-CoV-2 infection during pregnancy on inflammatory and humoral responses in maternal and fetal samples and compare antibody responses to SARS-CoV-2 among pregnant and non-pregnant women.

Design: Immune responses to SARS-CoV-2 were analyzed using samples from pregnant and non-pregnant women who had either tested positive or negative for SARS-CoV-2. We measured, proinflammatory and placental cytokine mRNAs, neonatal Fc receptor (FcRn) receptor expression, and tetanus antibody transfer in maternal and cord blood samples. Additionally, we measured anti-spike (S) IgG, anti-S-receptor binding domain (RBD) IgG, and neutralizing antibody (nAb) responses to SARS-CoV-2 in serum or plasma collected from non-pregnant women, pregnant women, and cord blood.

Setting: Johns Hopkins Hospital (JHH) Participants: Pregnant women were recruited through JHH outpatient obstetric clinics and the JHH Labor & Delivery unit. Non-pregnant women were recruited after receiving outpatient SARS-CoV-2 testing within Johns Hopkins Health System, USA. Adult non-pregnant women with positive RT-PCR results for SARS-CoV-2, within the age range of 18-48 years, were included in the study.

Exposures: SARS-CoV-2

Main Outcomes and Measures: Participant demographic characteristics, antibody titers, cytokine mRNA expression, and FcRn receptor expression.

Results: SARS-COV-2 positive pregnant women expressed more IL1β, but not IL6, in blood samples collected within 14 days versus > 14 days after a confirmed SARS-CoV-2 test, with similar patterns observed in the fetal side of placentas, particularly among asymptomatic pregnant women. Pregnant women with confirmed SARS-CoV-2 infection also had reduced anti-S-RBD IgG titers and were less likely to have detectable nAb as compared with non-pregnant women. Although SARS-CoV-2 infection did not disrupt FcRn expression in the placenta, maternal transfer of nAb was inhibited by SARS-CoV-2 infection during pregnancy.

Conclusions and Relevance: SARS-CoV-2 infection during pregnancy was characterized by placental inflammation and reduced antiviral antibody responses, which may impact the efficacy of COVID-19 therapeutics in pregnancy. The long-term implications of placental inflammation for neonatal health also requires greater consideration."

bioRxiv: Brief Report: The Virucidal Efficacy of Oral Rinse Components Against SARS-CoV-2 In Vitro (posted 13 November 2020)

"The ability of widely-available mouthwashes to inactivate SARS-CoV-2 in vitro was tested using a protocol capable of detecting a 5-log10 reduction in infectivity, under conditions mimicking the naso/oropharynx. During a 30 second exposure, two rinses containing cetylpyridinium chloride and a third with ethanol/ethyl lauroyl arginate eliminated live virus to EN14476 standards (>4-log10 reduction), while others with ethanol/essential oils and povidone-iodine (PVP-I) eliminated virus by 2-3-log10. Chlorhexidine or ethanol alone had little or no ability to inactivate virus in this assay. Studies are warranted to determine whether these formulations can inactivate virus in the human oropharynx in vivo, and whether this might impact transmission."

Events

WHAT: CDC COCA: The Impact of Telehealth on Health Equity from the Perspective of Large Healthcare Systems during the COVID-19 Pandemic

WHEN: Tuesday, 08 December 2020, 1400 – 1500 ET

DETAILS: During this COCA Call, presenters from Kaiser Permanente and the Veteran's Health Administration will discuss how telehealth has affected health equity in their patient populations before and during the COVID-19 pandemic. Topics to discuss include challenges and opportunities related to telehealth implementation. Presenters will share strategies to expand access that can reduce disparities and improve culturally responsive care to help achieve health equity within each organization. In addition, presenters from the Centers for Disease Control and Prevention (CDC) will share telehealth strategies that incorporate CDC's frameworks to Addressing Health Equity in Public Health Practice.

Free CE available

See: https://emergency.cdc.gov/coca/calls/2020/callinfo_120820.asp

News in Brief

The US has passed 11 million cases of coronavirus and 250,000 deaths (NPR).

There are over 1 million cases in children, representing 11.5% of all cases (AAP)

"More than 3 million people in U.S. estimated to be contagious with the coronavirus" (WaPo).

Vaccines

More big vaccine news: A week after Pfizer announced its COVID-19 vaccine was >90% effective, Moderna reported a preliminary analysis that suggests its vaccine is almost 95% effective (WaPo; read Moderna's press release for more data).

Pfizer and BioNTech are expected to file with the FDA on Friday for emergency authorization for the COVID-19 (WaPo).

It will take weeks for the FDA to vet any COVID-19 vaccine before approval (Business Insider).

Pfizer is looking at 4 states – RI, TX, NM, and TN – to start a pilot delivery program to distribute its vaccine, which requires ultra-cold storage (Reuters).

There are still other vaccines being researched and in development; Medicago and GSK are starting phase 2/3 trials of their COVID-19 vaccine (Medicago).

CureVac's coronavirus vaccine candidate is stable at normal refrigerator temperatures – something that will be important for distribution (CureVac).

It's starting to feel like there might be an end to the pandemic (Atlantic).

"Echoes of a pandemic: Experts fear lessons from the 2009 H1N1 vaccine drive are being ignored" (WaPo).

Exposure, Testing, and Risks

We know SARS-CoV-2 is spread primarily by airborne droplets. So why are we still wiping down surfaces? (NYT)

"The next COVID dilemma: how to make buildings breathe better" (Wired).

"What the data say about asymptomatic COVID infections" (Nature).

Thanks, Coronavirus: Healthcare Workers in Crisis Edition

COVID's third surge is breaking healthcare workers (Atlantic).

In more than half the country, hospitals are dealing with massive shortages of nurses, doctors, and other staff (STAT).

The Mayo Clinic has almost over 900 staff with COVID-19; they were infected in the past 2 weeks (Medpage).

More than 60 staff at the World Health Organization headquarters in Geneva have contracted SARS-CoV-2 (AP).

"Thousands of medical practices are closing, as doctors and nurses decide to retire early or shift to less intense jobs" (NYT).

A hospital in Utah had conspiracy theorists / covid deniers try to enter the ICU to see if it was really full as reported (KSL).

A Thousand Words

"Travelers look on as airline crew members wearing full personal protective equipment walk through a terminal at LAX" (Twitter; photo used without permission).

Other Outbreaks and Health Threats

The WHO has declared that the 11th Ebola outbreak is over, nearly six months after the first cases were reported (WHO).

There is emerging evidence that Chapare virus, a hemorrhagic fever first reported in Bolivia, is spread by humans (ASTMH).

Nigeria is reviving vaccine initiatives after a spike in yellow fever deaths (Guardian).

Dolly Parton Is Awesome, That's All

"Dolly Parton helped fund Moderna's vaccine. It began with a car crash and an unlikely friendship" (WaPo).

Dolly's vaccine involvement led to some creative remixes of her music. See this twitter thread rewriting 'Jolene' with a vaccine theme (Twitter). Someone even recorded it! (Twitter; also with captions).

Want more evidence of Dolly's awesomeness? Listen to the 9-part podcast 'Dolly Parton's America' – released last year, in the before times (Radiolab).

Disclosure: I am from the same hometown as Dolly and have a personal family connection to her – my dad grew up with her, and my paternal grandmother was one of her schoolteachers for years. I fully admit to massive bias in favor of Dolly and the good she puts out into the world.

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Special Reports

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